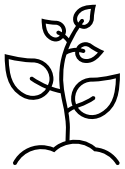
Community Waters Science Unit

Name: _____

Teacher's name: _____ School: _____

What do you like about the rain? Draw a picture or write a story below!



ISLANDWOOD™

Community Waters Pre-Unit Take Home Interview Date: _____

Student's Name: _____ Adult's Name: _____

Interview an adult in your household to see what they know about stormwater in your neighborhood.

Student reads to adult and records answers:

At school we are going to be studying what happens to rain after it falls in our city. Rainwater that flows across the ground is called "stormwater runoff." My class will be investigating where stormwater goes in our schoolyard and neighborhood and the problems it can cause. Then our class will be choosing a location with a stormwater runoff problem and designing a solution for it.

I want to learn more about your experience with rain when you were young. Can I ask you some questions?

1. What did you like to do when it rained? Did you like the rain? Why?

2. Where did the stormwater runoff go where you lived? Where did it end up?

3. What is a story about the rain you experienced or were told when you were my age? Do you remember rain causing any problems?

4. Does our family or culture have any traditions or stories that connect to water?

After recording your adult's answers, flip the page over and have them ask you the questions on the back.

Adult asks student:

1. What do you like to do when it rains?

2. What have you noticed happen to rain on the ground?

3. Do you go outside when it rains during recess at school? Does the rain ever cause any big puddles or other problems around your school?

4. How are my experiences with rain the same or different than yours? Why do you think so?

Surface Investigation Data Sheet

Investigation Team: _____ Date: _____

Weather: _____ Ground wet or dry? _____

Map #	Surface	Description of surface before pouring water	What plants are present?	Observations after water is poured on surface
Record the # on map	Find a location that matches this for your test	Use descriptive words. What do you see on the ground? What does it feel like?	What kinds and how many? *Grass? Trees? Weeds?* *A lot? A few?*	Check boxes below if "yes":
1	Concrete			❑ *Water in a puddle* ❑ *Water moving as runoff* ❑ *Water soaking into the groundwater* ❑ *Dirt moved by water or other forms of erosion* *What else do you see?*
2	Soil with Plants			❑ *Water in a puddle* ❑ *Water moving as runoff* ❑ *Water soaking into the groundwater* ❑ *Dirt moved by water or other forms of erosion* *What else do you see?*
3	Bare Soil			❑ *Water in a puddle* ❑ *Water moving as runoff* ❑ *Water soaking into the groundwater* ❑ *Dirt moved by water or other forms of erosion* *What else do you see?*

Investigation Procedure

1. Write down the date, weather, and if the ground feels wet or dry.
2. Find a surface in the schoolyard that matches one of the rows on the table and the amount of slope the class agreed on. Confirm the location with an adult.
3. Mapper writes the number for that surface on the **schoolyard map** to show where it is located.
4. In the "Description of surface BEFORE pouring water" column, write a description of the surface.
5. In the "What plants are present?" column, note what kinds of plants are present (like grass, trees, bushes, etc), and if there are a lot or a little.
6. Shake a rainwater jar from <u>waist height in the same location</u> until 1000 mL has been released.
7. In the "observations of surface" column, make observations of what happened to the water and surface it fell on. Check the boxes in that column if you observe those things.
8. Find a different surface from a different row and repeat steps until all rows are filled in.

GROUP ROLES

Could be traded off if desired.

1. **Recorder:** Fills in the row for the location on the group's data table
2. **Mapper:** Records the number of the location on the group's schoolyard map.
3. **Photographer or Drawer:** Take before and after pictures or drawings of the location.
4. **Water Shaker:** Shakes out the water.
5. **Water Filler:** Refills the rainwater jar to 1000 ml between uses.

ALL: Help the mapper find the location on the map and describe the location and what happens for the recorder to write down.

Stormwater Scavenger Hunt - *What's in my neighborhood?*

Name: _____ Date:_____

We have been studying water runoff around our school. The purpose of this assignment is to gather information about the places and things that affect the amount and rate stormwater runoff in your community.

Directions: Take a walk with an adult around your neighborhood and search for the items listed in each of the boxes on this page and the next - how many can you find?

When you find an item, draw an example in the box and label your drawing. Keep an eye out during your search for an **area you predict or see could help or cause problems with stormwater runoff**. When you find one, draw a picture of it in box 9 on the back of this sheet.

Stormwater Scavenger Hunt Items:

1) Storm drain	2) Stream/creek, pond, or lake Do you know its name?
3) Garden or rain garden	4) Drain from a roof
5) Steep slope with plants	6) Steep slope with pavement
7) Something that might get carried into a storm drain	8) Something that collects stormwater runoff from a roof or pavement

Stormwater Scavenger Hunt - *What's in my neighborhood?*

9) Draw a picture of an area that is helping or causing problems with stormwater runoff:

Label the things that might **speed up** the water:

- ✓ Slopes or hills
- ✓ Rooftops
- ✓ Concrete or asphalt

Label the things that might **slow down** the water:

- ✓ Trees
- ✓ Other plants
- ✓ Ponds or other places for the water to sit

Use <u>arrows</u> to show the direction water is or would be flowing.

How well does this area handle stormwater runoff? Use evidence to support your answer.

_____

_____

_____

_____

What Happens To Stormwater At Our Problem Site?

Name: _____

Problems created by our site's stormwater include: _____

_____

1) Draw a map of our site in the box. The map should include buildings, large objects, and the problem with stormwater.

2) Explain with arrows, drawings, and words where stormwater runoff goes when it rains. What is causing the problems at the site?

Stakeholder Interview

Your name: _____ Date: _____

Name of person interviewed: _____

What is their role or job? (student, parent, school staff, something else?) _____

Explain what you've been learning about (stormwater runoff in the city) and show the person you're interviewing your map of the site. Explain that it's showing a place that your class decided to focus on when thinking about solutions to stormwater runoff problems.

Questions for the stakeholder:

How do you use the site?

Why do you care about this site?

Do you have any concerns about stormwater runoff or too much water in this area?

Is there a project to help with these problems that you would recommend?

Are there any concerns you have about changes to this site?

Don't forget to thank the person you've been talking to for their time!

Evaluating Solutions Worksheet

The stormwater problem that we care about is _____.

Read about a solution and write down its name and one interesting thing you found out. ↓	*How does the solution help meet the criteria for success?*		*How does the solution fit within the constraint?*	
	Criteria #1:	Criteria #2:	Constraint #1:	Constraint #2:
Solution:				
Solution:				
Solution:				
Solution:				
Solution:				
Solution:				

After evaluating the solutions based on our research, we would like to test out this solution:

_____

This solution would meet the **criteria for success** because:

_____

_____

_____

Evidence from the summary table that supports my thinking is:

_____

_____

_____

Our group's favorite thing about this solution is:

_____

_____

_____

Measuring Stormwater Runoff Investigation - Data Table Date: _____

Team Member Names: _____

Trial	Amount Runoff Collected	Observations
Teacher Site Model without solution	_____ ml	
Our Site Model with solution Our solution is:	_____ ml	

1) The difference in amount collected between the teacher model and our team model: _____

2) If we were to make changes to our model, I would:

_____

_____

_____

3) A lesson from our investigation to share with the class is: _____

_____

_____

Stormwater Solution Conclusion

Claim-Evidence-Reasoning (C-E-R)

Name: _____ Date: _____

Question: How effective is the solution your group modeled?

C (Claim) • Write a statement that says what solution your group modeled and how effective it would be for our site.	
E (Evidence) • Provide scientific data from investigations and research to support your claim. • Your evidence should be appropriate (relevant) and sufficient (enough to convince someone that your claim is correct).	
R (Reasoning) • Begin your reasoning with "Therefore," or "Hence," or "This shows." • Explain how your data proves your claim. • Use **scientific principles and knowledge that you have about the topic** to explain why your evidence (data) supports your claim.	

Community Waters Take Home Interview Date: _____

Student's Name: _____ Adult's Name:_____

Ask an adult in your household to do this assignment with you. In the first section are some questions for them to ask you. Don't forget to share this back with your teacher!

Adult Asks Student:

Interview your student by asking the questions below to find out what they have learned in science class.

1. Why are there stormwater problems in cities? What kinds of things increase the amount of stormwater runoff?

2. What stormwater problem did you design a solution for? What was the solution you designed?

3. What could you and I do that would help with stormwater problems?

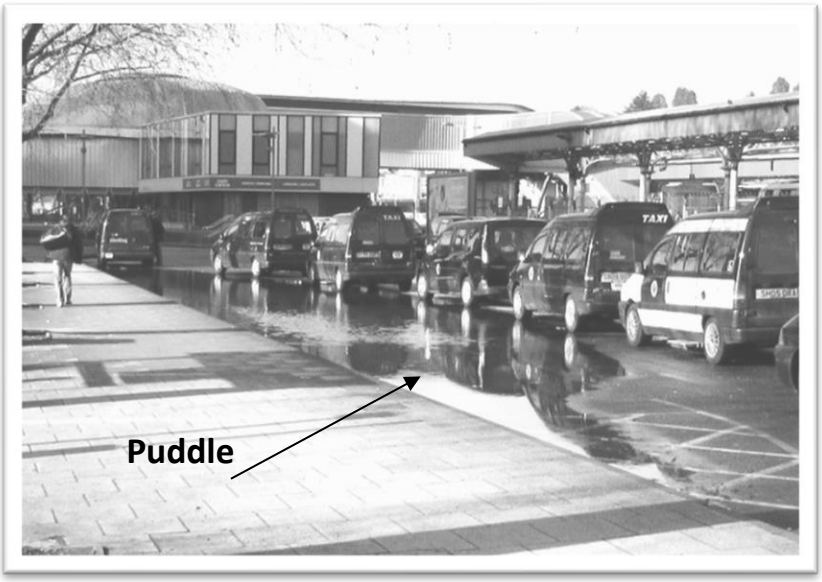
Community Waters:

Name: _____

Date: _____

Show Your Understanding

After building a new parking lot at a light rail station in the city, it is flooding when it rains and people are getting their feet wet when they park. The city wants to fix the parking lot so people won't get their feet wet. The city is also concerned about reducing pollution that might end up in Puget Sound.



1. Based on the description above, what are the two criteria that will help the city decide if a solution has been successful?

1.

2.

The city is considering adding more storm drains, but is seeking other ideas that would keep people's feet dry and also reduce the pollution going into the Puget Sound.

2. What would you suggest as a solution for the parking lot, instead of storm drains?

My solution (write the title of your design here)**:**

DRAW or DESCRIBE WITH WORDS your design idea here:

3. Which solution will better reduce flooding in the parking lot *and* reduce pollution in Puget Sound?

(CIRCLE ONE) #1: My solution #2: Adding more storm drains

4a. Circle TWO science ideas from the box on the right that help explain why you chose the solution you did above in #3.

SCIENCE IDEAS

- Impervious surfaces
- Pervious surfaces
- Slope
- Erosion
- Runoff
- Groundwater
- Soil
- Absorb

Then, WRITE your claims in the boxes below and use the two science ideas you circled to explain why the solution you chose would do a better job keeping feet dry and reducing pollution in Puget Sound.

4b. My claim that _____ *(#1 My solution or #2 Storm drains)* ***is a good one*** **because:**	**4c. The other solution will not be as successful because:**

Continue to next page.

✓ **CHECKLIST**

Did you remember to:

☐ Choose two science ideas and include them in your explanations?

☐ Say how the solution you chose meets the criteria better than the other solution?

☐ Say how the other solution does not meet the criteria as well as the solution you chose?

5a. What is one kind of data that you could collect that would support your claims?	**5b. How would this data help you understand how well the solution is working?**