

HISI - LESSON OUTLINE

Module Title Stormwater Diversion and Management LS Team Arcata/SR

Grade level(s): 9-12

Lesson # 2 Title: Brainstorming	Number of Minutes: 50
<p>Mathematical purpose: Brainstorm all the elements that will be going into solving the problem.</p> <ul style="list-style-type: none"> • Average total rainfall on campus (volume in cubic meters) • Surface area of campus • Surface area of driveways/paved regions • Surface area of rooftops <p>Defining Variables.</p>	<p>Scientific Purpose: Brainstorm solutions to managing stormwater runoff.</p> <ul style="list-style-type: none"> • How might you reduce stormwater runoff from driveways/parking lots or rooftops?
<p>Materials needed:</p> <ul style="list-style-type: none"> • Post-its, a stack per team • Large paper or small whiteboards, one per team. 	<p>Academic vocabulary:</p> <p>Stormwater Diversion Surface Area Volume Average Precipitation Cubic Meters</p>
<p>Common Core Standards:</p> <ul style="list-style-type: none"> • Make sense of problems and persevere in solving them. • Reason abstractly and quantitatively. • Model with mathematics. • Use appropriate tools strategically. 	<p>Next Generation Science Standards:</p> <ul style="list-style-type: none"> • Asking questions (for science) and defining problems (for engineering) • Developing and using models • Planning and carrying out investigations • Using mathematics and computational thinking
<p>When students are finished they will understand:</p> <ul style="list-style-type: none"> • Tasks exist with more than one solution 	<p>What are teacher questions or prompts?</p> <ul style="list-style-type: none"> • Can you think of anything else?

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<ul style="list-style-type: none"> • There are multiple approaches to stormwater management. 	<ul style="list-style-type: none"> • Say “yes” to all ideas and write them down.
<p>What are questions you anticipate students will have?</p> <ul style="list-style-type: none"> • How many brainstorm ideas do we need? • Is this correct? • How do we manage storm water? • What are management plans? 	<p>What are misconceptions students might have?</p> <ul style="list-style-type: none"> • This isn’t math. • Uncomfortable with brainstorming. • Uncomfortable with open ended solutions. • “I can’t think of anything else.”
<p>General outline of the lesson:</p> <p style="text-align: center;">HISI Storm Water Diversion: Lesson Design Template</p> <p>Subject(s): Integrated II Grade(s): 9-12 Teacher(s): Koczera, Zamboni, Wozniak, Bagnall, Zapper School: AHS; SRCHS</p>	
<p>Lesson Elements</p>	
<p><u>Background Knowledge:</u> What do the students already know/what have they studied, that has prepared them for this lesson?</p> <p>Area and Volume formulation, unit conversions, data collection, right triangle trigonometry, what stormwater is.</p>	
<p><u>Learning Target:</u> What will students know and/or be able to do as a result of this lesson? <i>(Student-friendly language)</i></p> <ul style="list-style-type: none"> • Students can brainstorm solutions. • Students can organize potential solutions into viable categories. • Students can identify elements needed to find surface area of campus • Students can identify elements needed to find volume of campus 	
<p><u>Standards:</u> What CCSS Subject or Anchor Standards are addressed in this lesson?</p> <ul style="list-style-type: none"> • Make sense of problems and persevere in solving them. • Reason abstractly and quantitatively. • Model with mathematics. • Use appropriate tools strategically. • Asking questions (for science) and defining problems (for engineering) • Developing and using models 	

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- Planning and carrying out investigations
- Using mathematics and computational thinking

Assessment: What evidence of student learning will you collect that demonstrates what students will know and be able to do at the end of this lesson? Formative? Summative?

(If possible, please link any links to rubrics, exams, assignment sheets, exit cards etc. that might be helpful to a teacher trying to trying to recreate this lesson.)

Exit Cards:

1. *What critical information do you have?*
2. *What might be information that you still need? Be specific.*

<p style="text-align: center;">Teacher Actions <i>What is my "air time" during this lesson?</i></p>	<p style="text-align: center;">Student Actions <i>How do I provide time and space for students to construct their own meaning?</i></p>
<p>Warm Up posted on board: Lead whiparound after discussion.</p> <p>Pose question:</p> <ul style="list-style-type: none"> ● How might you manage stormwater runoff? <ul style="list-style-type: none"> ● How might you reduce stormwater runoff from driveways/parking lots or rooftops? <p>Provide Post-its.</p> <p>Set timer for independent brainstorming for solutions.</p>	<p>Warm Up on board: Share notes from reading and discuss article from yesterday in groups. Each student identify one sentence to summarize thinking, learning, or ask a question.</p> <p>Brainstorm Solutions:</p> <ul style="list-style-type: none"> ● All students write ideas, regardless of feasibility and whether correct or incorrect. Put on central white-board/large paper. ● Read and organize into subtopics on whiteboard/paper and label categories

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Set timer for independent brainstorming for elements needed..

Brainstorm all the elements that will be going into this:

- Average total rainfall on campus (volume in cubic meters)
- Surface area of campus
- Surface area of driveways/paved regions
- Surface area of rooftops

Supplemental files/resources will follow