**TITLE**

# RE-DESIGNING WATER *(a 5 day summer camp curriculum)*

**DESCRIPTION**

Water is critical to live on Earth. What do our water systems look like? How might we improve these systems and better protect this valuable resource? During this one week camp, students will explore water systems and issues threatening our water supply through a series of design challenges. We are going to apply design thinking principles to develop collaborative prototype solutions. While the focus of our activities will be adjusted based on student interests, we will likely start with challenges along these lines:

- How might we improve water conservation?
- How might we solve the plastic water bottle dilemma?
- How might we reengineer water systems?

Through guided play and discovery, our activities will include: conducting interviews, researching on-line, collecting data, building user stories, synthesizing ideas, framing issues, defining problems, designing prototypes, building and presenting models, all while experimenting with techniques for collecting, organizing, focusing, visualizing, mapping and presenting ideas.

**PRIMARY OBJECTIVES**

Collaborate! Get creative! Have fun!

**SUBJECT AREAS**

Earth Science, Environmental Engineering, Design,

**OVERVIEW**

$6^{th}$ – $8^{th}$ grade students for 5 hours per day for 5 days (*20 hours of guided play and discovery*)
To be held in a science classroom, stocked with art supplies, and equipped with computer(s)/internet access, a printer, a water table and a sink. Supply list and operating budget is under development.

**STUDENT ACTIVITIES** (*Rough Draft Day 1*)

**Introductions… ice-breaker… capturing, organizing and mapping ideas…**
*(A data collection and organizing process to be used in design challenges as the week progresses)*

Organize chairs in the room into a circle, with one chair per student. *Activity requires that the coach participate.*

**Instruction** Coach: "Before we start… I'd like everyone to take a post-it and a pen and write down your favorite location… a geographic place you have visited or you really want to visit. Don't think about it… just write it down… any location… not a place like the coffee shop, but instead a place like the park on $130^{th}$, or a place like Seattle, or Boston, or Florida. Don't think about it. Just write it down. Got it? Now under it write 3 words… characteristics—what is it that you like about that place? No need to explain, just capture the idea so when it is your turn you can share one of them with us." Coach enters center of circle… "Hi. My name is Eric. I really like Florida. I like the beaches, the water, and the wild dolphins I have seen there." If your location has anything in common with mine or you just happen to like it, please stand up. OK. Now everybody switch chairs. The last person standing gets to go next. Once you have gone pull your chair back to an outside circle.

Now that we have learned a few names… and we have learned something about what you all like… let's see how we might organize that information.

Categories, Themes, Locations… whatever ideas works. Have first three kids who suggest categories create a work space for what will be their group—for the next few minutes you guys are going to be the <u>managers</u> for your group. If you think your place fits better into one of these categories than another go join that group and place your post-in under their category.

**Objective:**
Introduce Kids and their favorite location,
describe the place,
collect ideas,
organize the data,
map the data
> *(Color coordinate post-its with mapped data)*

**Room:**
- 3 to 5 large sheet of flip chart paper are taped to the wall and labeled "work space: _____" – Each assigned a color. Post its of this color will be placed on map or in other places to make a connection to or from this group of ideas. When mapped this color post-it will be placed on the map—an envelope of post-its of this color will be next to work space.
- Name Tags, Post-it, index cards, markers, highlighters, and a role of blue tape are in a shoeboxes each labeled Group 1 etc.
- Chairs are in a circle and tables to outside of room but not against walls, we need access to the walls.

**Possible Roles**
*(2 of each-assignment cycle)*
Project Coordinators
Creative Director / Managers

Now that we have groups. Have one person in your group grab a box. Find the two "Reporter" tags and the one "Manager" tag. Give the manager tag to the manager. Find two people to play the role of "Reporter" for the next few minutes. Reporters you are going to need a few index cards and a pencil.

The job of the reporter is going to be to capture some observations about the group activity. If you discover:

- there is a great discussion taking place, or
- something that works well for your group, or
- some great idea that doesn't fit on your board, or
- notice something that does not work… try to capture it on an index card.

Reporters it is your job to get the idea on to an index card. Not the whole story. Just a phrase that will convey an observation to help your group report back later. Everyone has to help the Manager and the Reporters. (*No Gatekeepers. No uninvolved Reporters-- discuss.*)

**Organize Ideas**

- Everyone gets to work together to organize Ideas. Group and order the locations/characteristics in some way that make sense to you. Managers you get to manage the discussion and process—but that means you need to hear from everyone. The best hint is to ask each other lots of (discuss). .
- Collect feedback during presentation—reporter captures feedback, other capture new ideas
- Each group presents results
    - o Revisit index cards. Write an explanation of the thought on the back of the card (*add category, idea & names for people in your group to the top*)
    - o Create additional cards for other key ideas that came out of work
    - o Present findings to the group
- What can we observe about ideas and how we have organized them? Are the reoccurring themes?
- Geographic relationships? … Proximity to mountains? … Water?
- Introduce maps and the idea of mapping data… map your data…use work-space color post-its to plot a data point on the map. Write on the post-it a note regarding the connection.

Note later in the week we will map the data using electronic mapping tools and coordinates.

- What do maps tell us and why are they important?
    … location, relationships, visualize data

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Investigators
Reporters - Documentation / Lab Notes
Analyst / Data collection

Web (PPT *backup w URLs*)
**Maps**
**Google Earth**
**Regional Map**
**Google Map with Fusion Data**

Have a large world map available to mark locations.

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**STUDENT ACTIVITIES**   (*Rough Draft Day 2*)

**Intro to Water**

- Where are our locations in relationship to water?
- What do our maps tell us about water?
- Why is water important?
    - o What do we know about water?
        - ▪ Water cycle, where water is, how water is used…
    - o Why should we care about water?
- Explore our immediate environment. How do we and the things around us impact water?
    Use the same process as above to organize ideas

**Collect & Organize Information using the process and tools from prior exercise.**

**Consider higher level connections.** Most everything around us requires water in is manufacturing, transportation, use, disposal, recycling or reuse.

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