

Grade: 6-8

Discipline: Science

Length: 2 classes

Target:

MS-ESS3-4	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems
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Essential Question(s):

1. How do our choices about land use and property design affect the health of a river and the surrounding environment?
2. What is the difference between point source and nonpoint source pollution, and why does it matter?
3. How can we design properties that meet our goals and dreams while also protecting natural ecosystems?

Objective: Students will design a dream riverfront property and explore how their choices affect the health of the river and other properties nearby. They will learn the difference between point source and nonpoint source pollution and observe how pollution can travel through a shared water system. They will use what they learn to think about how we can build in ways that protect the environment.

Materials/Resources:

- White printer paper for drawing property
- Colored pencils
- [mini cubes](#) (or anything small to represent pollutants that you can easily reuse)
- Large piece of blue bulletin board paper to represent the river
- RiverFront Property Reflection

Lesson Summary:

In this lesson, students design their dream riverfront property with no limitations, considering how they would use the land. After creating their properties, they place them along a classroom model of a river and explore how different land uses affect water quality. Through hands-on simulations, students learn about point source and nonpoint source pollution and how pollution from one property can impact the entire river system. The activity highlights the importance of responsible land use and environmental stewardship.

Outline of Activity

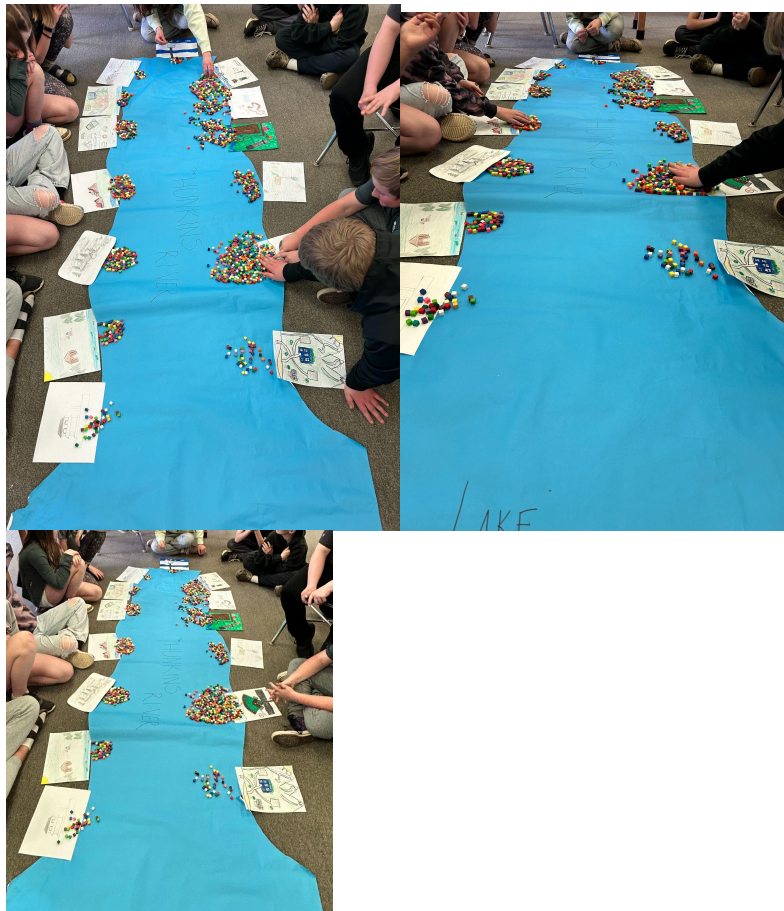
Day 1

- Tell students you have some fantastic news to share with them and they have “won the

lottery!!” And, on top of that, they also won a beautiful piece of riverfront property! Tell students that they can develop their property with anything they want because they have an endless supply of money from winning the lottery. I let them know they can design their house of their dreams, an amusement park, a mall, a small dock for fishing- the possibilities are endless. The only requirement is they color it in, it takes up the whole page and they have to have a portion of the river on their property. Students will usually take the entire class to design and draw their property.

Day 2

- Place the blue bulletin board paper down the middle of the classroom and invite students to come and claim their space on the river with their property they designed.
- Start upstream and work your way downstream with the properties.
 - Have each student describe their property- what is on it and any clarifying questions you might have about their property
 - Ask students what the impact of their property has on the stream? What potential pollutants might you find at their property?
 - Ex. construction pollution- soil, trash? Or grass clippings or oil? Do they have a garden and if so do they use pesticides or fertilizers? Farm- do they use cow manure? Have students brainstorm the different types of pollutants they could potentially come from their property.
 - Add small cubes to represent the pollution (this is qualitative- make a judgement (see images below))



- Have the students move all their pollutants off their property (I tell them there was a huge rainstorm and it all got carried off in runoff). They then push the cubes downstream towards the lake (or body of water your river is running into. I ask them if it is fair that runoff pollutants from upstream are now in front of their property- especially if their property had minimal impact to the river/land. (see image below)



Day 2 (Continued)

- Once all the pollutants have been pushed downstream I pick up a random cube and ask them if they can identify where that specific cube came from. They will answer “no” because there is no way to tell whose property it came from. I explain to them that this is called “nonpoint source pollution.” We cannot identify where exactly it came from. I then give them the example of a sewage pipe directly releasing sewage/water into the river and explain that I can point directly to that source of pollution and that kind is called “point source pollution.” We then have a discussion around why nonpoint source pollution is so hard to address and what can we do to our properties to reduce our impact.

Day 3

- Students complete the Riverfront Property Reflection Questions

