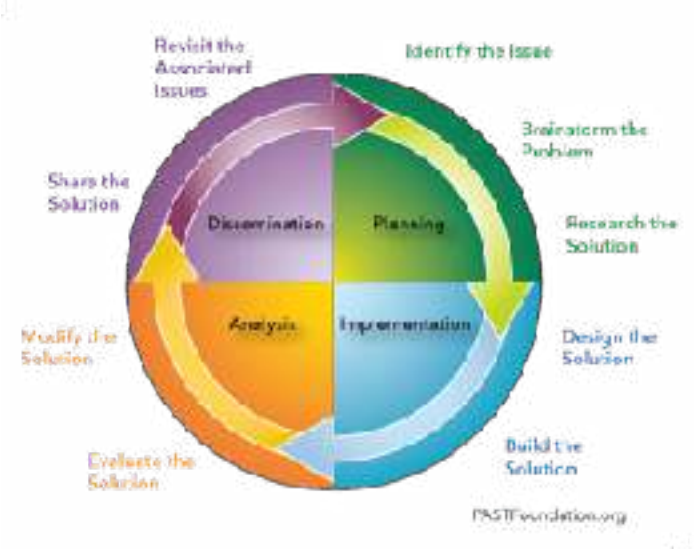
Name:_____

Date:_____

Erosion
Mini Challenge



Problem Scenario: The Missouri River significantly erodes soil away from South Dakota. At the joining point with the Mississippi just north of St. Louis you can see the amount o silt in the water compared to the Mississippi River. This erosion can be good and bad. You will be investigating the effect erosion can have on South Dakota to mitigate the dangers and problems it may cause.

Challenge:
How can you reverse the effects erosion has on river banks? How and why does erosion happen?

Criteria:
- Sand/soil/ cooking sheet pan/ water
- Document the amount of erosion both mathematically and visually
- Create multiple ways to mitigate erosion
- Document the effects of erosion that goes unchecked

1. Brainstorm: Use the space below to brainstorm the design and approach to mitigate the dangers of erosion.

- Where do you think the silt in the river comes from?
- Where do you think the silt in the river normally goes? What about when the river floods?
- How do you think we could limit the amount of erosion the river causes?
- How do you think we could encourage the amount of erosion the river causes?

2. Design:

1. Place sand or soil in a cake pan until it is about half full.
2. Make sure the sand is evenly spread across the pan.
3. Tilt the pan slightly by propping up the pan one end with a textbook.
4. Slowly pour water into one spot on the higher side of the pan.

3. Build:

1. Watch what happens to the sand as you pour the entire cup off water into the pan.

2. Draw what you observe in the sand:

   - What does it remind you of?
   - What could you do to prevent the sand from washing down hill?

4. Evaluate:

- How can you improve your design?
- How much sand is being moved in each test case (fast pouring and slow pouring)?
- Is there a way to slow down the water flow?
- How do you think this relates to the Missouri river?
- What effect do you think dams have?

5. Modify:

Try to reduce the amount of sand movement even more and try step 3 “build” again. Build a “dam” and see what effect that has. What do you think is the best way to increase and decrease the amount of sand moving?

6. Share:

Share your creation on Social Media!
Tag us on Facebook, Twitter or Instagram @pastfoundation
Use the hashtag #ThisIsPAST or #DesignThinking