

Dams

Virtual Instruction Lesson Plan

Episode 3: (14:19-25:35)
bit.ly/steamcamp-weather-dams

Visit Hoover Dam to learn why dams were built along the Lower Colorado River.

Related Nevada Academic Content Standards/ Next Generation Science Standards:

- K-2-ETS1-2.** Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.
- 2-ESS2-2.** Develop a model to represent the shapes and kinds of land and bodies of water in an area.
- 3-5-ETS1-1.** Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
- 3-5-ETS1-3.** Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

Materials

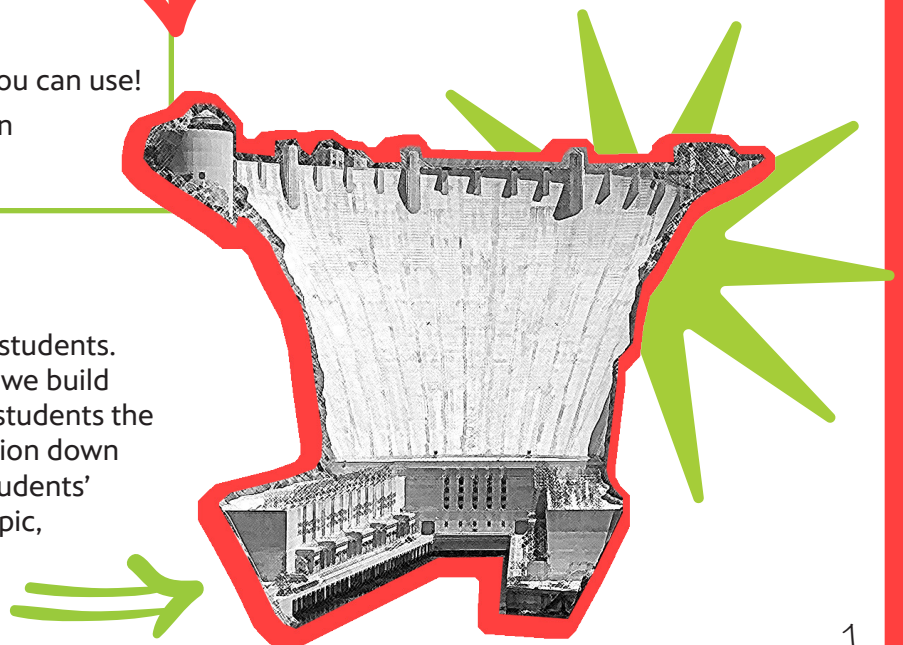
- Paper/pencil
- An assortment of items to use for dam-building, such as:
 - Rocks of various sizes
 - Sand/dirt
 - Craft sticks
 - Be creative and see what else you can use!
- An aluminum pan or small plastic bin
- Water

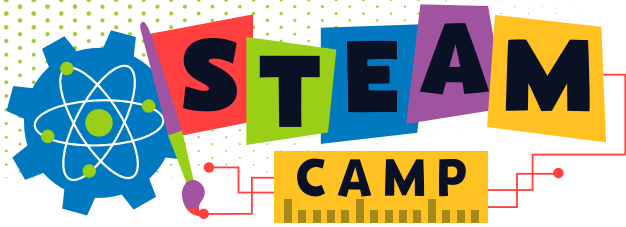
Tip:

This lesson plan is easily adaptable for face-to-face instruction. Simply conduct the “Explore” portion of the lesson as a hands-on activity in the classroom.

Engage:

Share the beginning of the program with students. After Luis asks, “I was wondering, why do we build dams?,” pause the program and ask your students the same question. Write this essential question down and record student responses to reveal students’ current knowledge, connections to the topic, and further questions they have.





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Explain:

Introduce the words: **reliable**, **reservoir** and **arch**.

- Have students guess their meaning and record their ideas.
- Ask students to listen for the words as they watch the video clip, featuring Natalie Starfish, Engineering Supervisor (14:10 – 17:52).
- When they hear one of words, encourage students to make a gesture, such as wiggling their fingers.

Pause the video at key spots to ask questions that strengthen comprehension and help children make connections.

- Pause after Natalie talks about how the Colorado River formed the Grand Canyon (15:27). Ask students, “What is the name of the lake Hoover Dam holds back? What river is below the dam?”
- Pause after Natalie discusses floods and droughts (15:52). Ask, “What two events kept happening that caused problems for people and farmers before the dam was built?” Add, “The dam made the river more reliable. What do you think that means?”
- Pause after Natalie explains what a gravity arch dam is (17:21). Have students model the shape of an arch with their arms, like Natalie did. Ask, “What would happen to the dam if the arch faced the other way? Why?” Remind students how strong water is, and how it formed the Grand Canyon.
- Pause after Natalie talks about how much water is in Lake Mead (17:57). Say, “Natalie called Lake Mead a reservoir. What do you think that means? Why does Las Vegas need a reservoir?”
- Watch the “What did we learn?” segment to reinforce the concepts.

Reflect on the new knowledge students have acquired.

- Revisit the essential question and have children answer it by incorporating the vocabulary words; ask children to share any new information they acquired or additional questions they have.
- Have students draw a simple map showing the location of the Colorado River, Hoover Dam, and Lake Mead. For more challenge, add Parker Dam, Lake Havasu, Davis Dam, and Lake Mojave to the map.

Explore:

Share the at-home activity segment in which Jessica outlines directions for creating a dam at home using everyday items (18:55-22:35). Then, guide students through the engineering design process outlined in the segment.

Define the Problem: Design a dam across the middle of a container that is both waterproof and strong enough to hold water back to create a reservoir.

Imagine and Plan: Gather different everyday materials, like rocks, sand, craft sticks, and dirt. Encourage them to be creative! Students will also need a container in which to construct their dam, such as an aluminum pan or plastic bin. Have students draw a sketch of their design before they start. How are they going to use their materials to build a dam strong enough hold water back?



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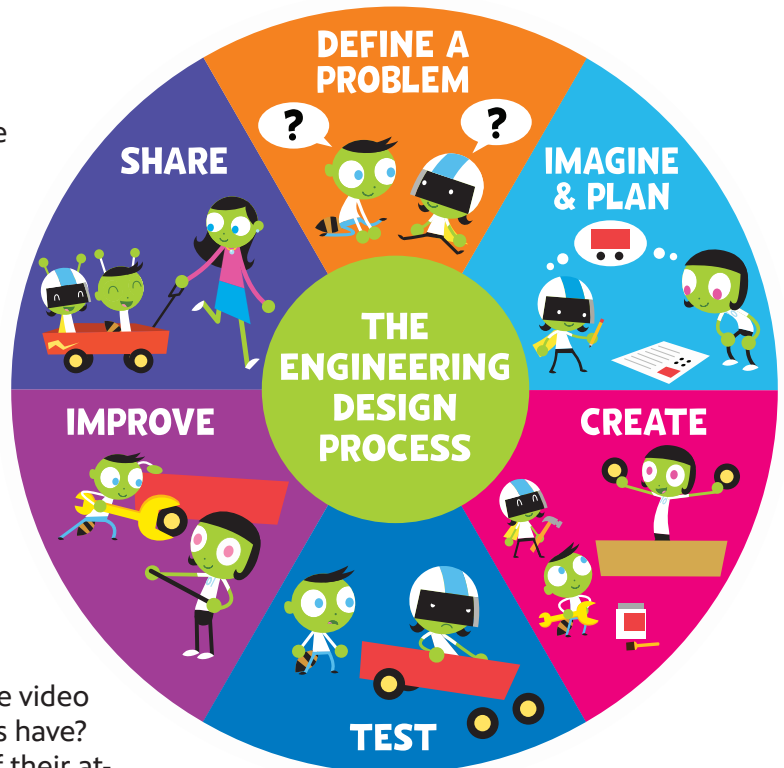
Explore, continued:

Create: The next step is to create their dam. Encourage students to take their time and test the pieces as they go. Testing your project as you go is a good way to save time and fix mistakes if you realize something isn't working.

Test: Have students test their dam by slowly pouring water on one side of the dam.

Improve: If students tested their dam and it leaked or collapsed, have them improve their design and test again. Would a different dam shape or additional materials make their design work better? If it did work, add some more water and see what happens!

Communicate and Collaborate: Have students share their designs. Which designs and materials created the strongest dams? Help students make connections between anything they learned in the video and this activity. What new questions do students have? Encourage students to share photos and videos of their at-home challenges with Vegas PBS at bit.ly/steamcamp-share.



Extend:

View the book talk with Shana, a local Young People's Librarian (23:23 – 26:08). If possible, share one of the books Shana previewed with students (**Building the Hoover Dam** by Rebecca Steffoff; **Canals and Dams! With 25 Science Projects for Kids** by Anita Yasuda; **The Dam** by David Almond).

Encourage students to continue exploring dams by accessing the following PBS KIDS resources:

- **Peep and the Big Wide World: Building Dams** – bit.ly/peep-buildingdams
- **Science Trek: Dams** – bit.ly/sciencetrek-dams
- **Wild Kratts: Building a Beaver Pond** – bit.ly/wildkratts-beaverpond